



CENTRAL VALLEY REGIONAL
WATER QUALITY CONTROL BOARD

CLEAN WATER ACT
SECTIONS 305(b) AND 303(d)
INTEGRATED REPORT
FOR THE CENTRAL VALLEY REGION

DRAFT FINAL STAFF REPORT

May 2009



CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY



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CLEAN WATER ACT SECTIONS 305(b) AND 303(d) INTEGRATED REPORT FOR THE CENTRAL VALLEY REGION

Draft Final Staff Report, May 2009

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EXECUTIVE SUMMARY

This Integrated Report provides the recommendations of the staff of the California Regional Water Quality Control Board, Central Valley Region (Central Valley Water Board) for changes to the Clean Water Act (CWA) Section 303(d) list of impaired waterbodies and provides a Clean Water Act Section 305(b) report on the water quality condition of waters within the Central Valley Region.

The Introduction provides the context and purpose and an overview of the approach and describes the public process that will be used for adoption of the changes to the 303(d) list and finalization of the Integrated Report. The remainder of the report describes data sources used, the objectives and criteria against which data were compared, the methodology for comparing the available data to the criteria to assess attainment of water quality standards and determine potential 303(d) listings, and the methodology used to categorize waterbody segments according to beneficial use support for the 305(b) report. Results are briefly summarized and discussed following descriptions of the methodology. Results are shown in detail in the appendices. Appendix A shows proposed changes to the 303(d) list. Appendices B through E provide lists of waterbodies in each Integrated Report category of beneficial use support. Appendix F presents “fact sheets” for each waterbody-pollutant combination that was analyzed for the proposed 303(d) listing decisions. These fact sheets include a proposed listing decision and at least one “Line of Evidence” describing the data and information used as a basis for each proposed decision. Appendix G presents fact sheets that describe other miscellaneous changes to the 303(d) list. Appendix H provides citations for all of the references used in developing this Integrated Report. Appendix I provides maps and lists of Delta Waterways. Appendix J provides staff responses to written comments received on the Public Review Draft.

Water quality data developed by internal programs and provided by outside agencies resulted in significantly more information than was available during the previous 303d list updates. Over 1,800 fact sheets, each assessing a unique waterbody-pollutant combination, were developed during this evaluation. These fact sheets contain over 3,700 lines of evidence. There are 390 proposed new 303(d) listings and 23 proposed de-listings. The large number of new listings is likely due to the large volume of new water quality data that was available since the most recent (2006) 303(d) List update, the protective water quality standards applicable to these waterbodies, and the requirements of the Listing Policy to evaluate all readily available data. Therefore, the number of proposed new listings does not necessarily reflect an overall decrease in water quality since the previous (2006) listing cycle and, more likely, reflects an increase in the amount of water quality data available for consideration.

For the 305(b) report, during the current evaluation, 386 waterbody segments were placed into one of five Integrated Report beneficial use support categories based on the assessment of the available water quality data. The categories and numbers of waterbodies in each category are listed below.

1. All core beneficial uses are supported (0-waterbody segments);
2. At least one core beneficial use is supported (24-waterbody segments);
3. Insufficient information to determine beneficial use support (95-waterbody segments);
4. At least one beneficial use is not supported but a TMDL is not needed (6-waterbody segments)

5. At least one beneficial use is not supported and a TMDL is needed (261-waterbody segments).

The core beneficial uses evaluated were aquatic life, drinking water supply, fish consumption, non-contact recreation, shell fishing, and swimming.

Changes to the 303(d) list for the Central Valley Region must be approved by the Central Valley Water Board in a public meeting, after consideration of public comment. The updated 303(d) list will then be submitted the State Water Resources Control Board and finally to the USEPA for approval before becoming final. Staff circulated a public review draft report in January 2009 for public comment, and held a stakeholder meeting in March 2009 to discuss the draft Integrated Report. Written comments received within the comment period have been responded to in writing in Appendix J. These comments resulted in several changes, discussed in Appendix J, to the proposed 303(d) List updates that are now contained in this draft final Integrated Report. The draft final Integrated Report, including proposed changes to the 303(d) list is scheduled to be heard by the Central Valley Water Board in June 2009.

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INTRODUCTION

The federal Clean Water Act (CWA) gives states the primary responsibility for protecting and restoring water quality. In California, the State Water Resources Control Board and nine Regional Water Quality Control Boards (Water Boards) are the agencies with the primary responsibility for implementing federal Clean Water Act requirements, including developing and implementing programs to achieve water quality standards. Water quality standards include designated beneficial uses of waterbodies, criteria or objectives (numeric or narrative) which are protective of those beneficial uses, and policies to limit the degradation of water bodies. The water quality standards for waterbodies in the Central Valley Region are primarily¹ contained in two "Basin Plans"- the Water Quality Control Plan for the Sacramento and San Joaquin River Basins (CRWQCB-CVR 2007), and the Water Quality Control Plan for the Tulare Lake Basin (CRWQCB-CVR 2004).

Clean Water Act Section 305(b) requires each state to report biennially to the United States Environmental Protection Agency (USEPA) on the water quality condition of its waters. CWA Section 303(d) requires each State to develop, update, and submit to the USEPA a list of those waterbody segments that are "impaired or threatened"- meaning not meeting, or not expected to meet, water quality standards. Impaired waterbody segments on the 303(d) list must be addressed through the development of TMDLs or by other means as described in the State's Water Quality Control Policy of Addressing Impaired Waters (SWRCB, 2005).

In conformance with USEPA guidance (USEPA, 2005), the Water Boards are preparing a single state-wide Integrated Report that meets the reporting requirements of CWA sections 303(d) and 305(b). The proposed changes to the 303(d) list (see Appendix A) were developed by Central Valley Water Board staff in conformance with the Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List (Listing Policy; SWRCB, 2004), which describes the requirements for developing the 303(d) List in California. Not all of the Listing Policy requirements are reiterated in this report, but key requirements are mentioned in the context of explaining the methodology used.

In order to meet CWA Section 305(b) requirements of reporting on the water quality condition of waters, each waterbody segment was assigned to one of five non-overlapping, overall beneficial use-support categories based on the assessment of the available water quality data. For each waterbody segment assessed, a beneficial use support rating of fully supporting, not supporting, or insufficient information, is determined for each of six "core" beneficial uses; aquatic life, drinking water supply, fish consumption, non-contact recreation, shell fishing, and swimming. Each waterbody segment is then assigned to one of the Integrated Report beneficial use categories below. These categories are based on the USEPA guidance (USEPA, 2005), but contain some modifications based on California's 303(d) Listing Policy:

¹ Additional water quality standards applicable to the surface waters in the Central Valley Region are contained in the Water Quality Control Plan for the San Francisco Bay-Delta (SWRCB, 2006) and the federally promulgated California Toxics Rule (CTR) (USEPA, 2003).

<u>Category</u>	<u>Description</u>
1	Evidence shows all core uses supported.
2	Evidence shows some core uses supported (at least 1).
3	Evidence is insufficient to make use support determinations.
4A.	Evidence shows at least one use not supported (but a Total Maximum Daily Load (TMDL) is not needed). A TMDL has been developed and approved by USEPA and is reasonably expected to result in the attainment of the water quality standard within a reasonable, specified time frame.
4B.	Evidence shows at least one use not supported (but a Total Maximum Daily Load (TMDL) is not needed). An existing regulatory program is reasonably expected to result in the attainment of the water quality standard within a reasonable, specified time frame.
4C.	Evidence shows at least one use not supported (but a Total Maximum Daily Load (TMDL) is not needed). Impairment caused by non-pollutant sources. No provision for this exists in California.
5	Evidence shows at least one use not supported (and a TMDL is needed).

Category lists 4A, 4B and 5 represent the 303(d) list of impaired or threatened waterbody segments in the Central Valley, and thus require public review and approval by the Regional Board. Once the changes to the 303(d) list of impaired or threatened waterbody segments in the Central Valley Region are approved by the Central Valley Water Board, the Integrated Report for the Central Valley Region, including proposed changes to the 303(d) list will be submitted to the State Water Resources Control Board (SWRCB). Once the changes to the 303(d) list for all of the Regions are approved by the SWRCB, California's Integrated Report will be submitted by the SWRCB to the USEPA, which has final approval authority over the changes to the 303(d) list. California's current 303(d) list was adopted by the State Water Board and the USEPA in 2006.

DATA AND INFORMATION USED FOR THE ASSESSMENT

In December 2006 the State Water Board solicited data from the public by issuing a formal solicitation notification. Data were received through January 2007 in eighteen submittals, which have been posted on the Central Valley Water Board website at <http://www.waterboards.ca.gov/centralvalley/>. The Central Valley Water Board held a workshop in September 2007 to discuss potential temperature listings in the San Joaquin River Basin. The workshop stimulated a wave of supplemental information submittals related to these potential temperature listings. In addition to the data received during solicitation and as a result of the temperature workshop, other readily available data from numerous other sources were assessed for the preparation of this Integrated Report, including the following:

- Irrigated Lands Regulatory Program (ILRP)
- National Pollutant Discharge Elimination System (NPDES) Program, including stormwater permit monitoring
- Surface Water Ambient Monitoring Program (SWAMP)²
- Grasslands Bypass Project
- Central Valley Water Board TMDL Program monitoring
- CalFed mercury studies
- Federal Energy Regulatory Commission (FERC) re-licensing projects
- Bay Delta and Tributaries database (BDAT)
- California Department of Pesticide Regulation Surface Water Database (SWDB)
- Sacramento River Watershed Program (SRWP)

Water quality data developed by internal programs (e.g., SWAMP and ILRP) and provided by outside agencies resulted in significantly more information than was available during previous 303(d) list updates. The individual “fact sheets” (described below) for each assessed waterbody segment-pollutant combination contain specific references to the data upon which each proposed 303(d) listing decision is based. The electronic versions of these fact sheets also contain Internet links to the files and documents containing the actual data and information used.

WATER QUALITY OBJECTIVES, CRITERIA AND GUIDELINES USED TO ASSESS ATTAINMENT OF WATER QUALITY STANDARDS

In development of the 303(d)/305(b) Integrated Report, readily available water quality data were compared to water quality objectives in the Basin Plans (CRWQCB-CVR 2007;

² More detail on the SWAMP water monitoring studies is available on the Central Valley Water Board SWAMP website at:
http://www.waterboards.ca.gov/centralvalley/water_issues/water_quality_studies/surface_water_ambient_monitoring/index.shtml

CRWQCB-CVR, 2004), which include Maximum Contaminant Levels (MCLs) promulgated by the California Department of Public Health, and the California Toxics Rule (CTR) Criteria. For pollutants which do not have numeric Basin Plan Objectives, MCLs or CTR Criteria, “evaluation guidelines” were used to interpret the Basin Plans’ narrative objectives in accordance with Section 6.1.3 of the Listing Policy, which states:

“Narrative water quality objectives shall be evaluated using evaluation guidelines. When evaluating narrative water quality objectives or beneficial use protection, RWQCBs and SWRCB shall identify evaluation guidelines... (that) ...may be used if it can be demonstrated that the evaluation guideline is:

- *Applicable to the beneficial use*
- *Protective of the beneficial use*
- *Linked to the pollutant under consideration*
- *Scientifically-based and peer reviewed*
- *Well described*
- *Identifies a range above which impacts occur and below which no or few impacts are predicted. For non-threshold chemicals, risk levels shall be consistent with comparable water quality objectives or water quality criteria.*

RWQCBs shall assess the appropriateness of the guideline in the hydrographic unit. Justification for the alternate evaluation guidelines shall be referenced in the waterbody fact sheet” (SWRCB, 2004).

For screening and assessing data for potential 303(d) list changes, evaluation guidelines were selected that provide adequate protection to the most sensitive designated beneficial use, which is consistent with the Listing Policy. The evaluation guidelines used include the following:

- Fish tissue levels of mercury, DDT, chlordane, dieldrin, toxaphene and PCBs were compared to OEHHA fish contaminant guidelines (OEHHA 1998, OEHHA 2008).
- Pesticide concentrations for which there are no adopted objectives were compared to USEPA or CDFG criteria. In accordance with section VI of the Basin Plan, if no aquatic life criteria were available for a pesticide, then one tenth of the 96 hour LC50 (lethal concentration for 50% of the test organisms) for the most sensitive aquatic test organism was considered for use as a daily maximum. If the lowest observed effects concentration (LOEC) from a valid toxicity test was lower than one tenth of the LC50 for the most sensitive organism, that LOEC was used. In all cases only LC50s and LOECs for freshwater test organisms were used.
- For *Escheria coli* (*E. coli*) bacteria, the USEPA’s Ambient Water Quality Criteria for Bacteria (USEPA, 1986) was used.
- For ammonia, the USEPA ambient freshwater aquatic life criteria were used.
- For salt, the low-end value (900 uS/cm) of the Secondary Drinking Water MCL range (900 uS/cm – 1600 uS/cm) was used.
- For temperature, sections 3.2 and 6.1.5.9 of the Listing Policy were followed. Temperature criteria developed by USEPA Region10, Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards (USEPA, 2003), were used as

evaluation guidelines. Information available on current water temperature conditions and information on historic use of the waters by salmon and steelhead were used to develop proposed 303(d) list changes.

DEVELOPMENT OF THE PROPOSED 303(D) LIST CHANGES

Because of the large volume of readily available data and information, it was necessary to prioritize use of limited resources and focus on potential changes to the current (2006) 303(d) list. Data and information were assessed at two levels of detail - 1) an initial screening, and 2) a detailed assessment/fact sheet development. In the initial screening, data and information were reviewed to determine if they contained any potential water quality standards exceedances. Additionally, readily available data from these information sources related to existing 303(d) listings were reviewed to see if standards are now being attained, thus warranting removal from the 303(d) list (de-listing). Where potential standards exceedances, (potential listings) or potential de-listings were identified, these waterbody-pollutant combinations were then prioritized for detailed assessment and fact sheet development.

For the waterbody-pollutant combinations identified in the initial screening, all available data was assessed to determine if they should be added to, or removed from, the 303(d) list. The assessments were documented in "fact sheets". Each source of available data and information was considered as one line of evidence in the fact sheets.

All of the fact sheet information and beneficial use support ratings for assessed California waterbodies are stored in the Water Boards' California Water Quality Assessment (CalWQA) database. The CalWQA database was developed to store detailed water quality assessment information and to help produce the Integrated Report. The database is designed so that this information can be exported to the USEPA's Assessment Database at the end of each assessment cycle. The assessment fact sheets (contained in Appendix F), as well as the lists of waterbody segments in each Integrated Report category (contained in Appendices B through E), were produced directly from the CalWQA database's report functions. The electronic versions of the CalWQA fact sheets contain Internet links to the water quality objectives and evaluation guidelines documents, and to the documents containing the water quality data and information for each assessed waterbody segment.

Because of the large volume of data available and limited resources, not all the information which was screened was entered into fact sheets in the CalWQA database. For example, if a waterbody was already listed as impaired for copper and the new data confirmed the existing 303(d) listing, then a fact sheet was not prepared. For the purposes of meeting SWAMP program goals, all SWAMP data through February 2007 was evaluated for each applicable core beneficial use/waterbody segment combination in order to support determination of the appropriate Integrated Report beneficial use support category. Fact sheets for all the SWAMP data were entered into the statewide assessment database.

Data were aggregated by waterbody segment following the requirements of Section 6.1.5.4 of the Listing Policy, and assessments were performed on the individual segments. Waterbodies were segmented to account for hydrologic features, such as major tributaries, and for land use. The segmentation included, at a minimum, the reaches listed in the Basin Plans. Many small

waterbodies were not divided into multiple segments. For clarity, some waterbody segment names include location information, such as the county and connecting upstream and downstream waterbodies. All waterbody segments assessed were also electronically mapped in a GIS (geographic information system).

In most instances, data were assessed using the binomial methodology contained in the Listing Policy (sections 3.1, 3.2, 4.1 and 4.2) to determine the frequency of water quality objective exceedances that would support an impaired listing or de-listing. In some cases, a Basin Plan objective, CTR criterion, or other water quality criteria contained an explicit maximum exceedance frequency. In these cases, in addition to using the default binomial methodology in the Listing Policy, the exceedance frequency in the objective or criteria was used to assess potential impairments under the weight of evidence listing factors in sections 3.11 and 4.11 of the Listing Policy.

Spatial and temporal representation of data was assessed using the requirements and guidance of the Listing Policy. As required by Section 6.1.5.6 of the Listing Policy, the available data were used to represent concentrations during the averaging period. For example, if only one data point were available during a 4-day period, it was used to represent the four-day average concentration for that period.

Proposed 303(d) List Additions and Deletions

Appendix A shows the proposed changes to the 303(d) list. Additions are shown in bold and de-listings are shown in strikethrough. The rationale for all 303(d) listing/de-listing decisions are documented in “fact sheets” in Appendix F. Over 1,800 fact sheets were prepared in the development of this report. Due to the amount of new data available, the numerous waterbodies and water quality issues in the Central Valley Region, the protective nature of water quality standards, and the requirements of the Listing Policy to evaluate all readily available data, there are 390 proposed new 303(d) listings (new waterbody segment/pollutant combinations) and there are 23 de-listings proposed. The proposed changes to the 303(d) list also include changes to show that TMDLs have been completed since the 303(d) list was last updated in 2006. In addition to the changes discussed above and shown in Appendix A, some waterbody segments’ geographic delineations or names have been revised, as documented in the “Miscellaneous Changes” fact sheets in Appendix G.

The number of proposed new listings should not be used to describe temporal trends in the overall water quality, since many of these waterbodies and pollutants have never been assessed before, and many of the newly identified water quality standards exceedances have likely been occurring for some time before being identified. Indeed, formal identification of the water quality problems on the 303(d) list can be viewed as an early step in bringing waters into attainment of standards through the Water Boards’ programs.

TMDL Scheduling

For waterbodies on the 303(d) list identified as needing Total Maximum Daily Loads (TMDLs), completion dates for the TMDLs are proposed. The proposed TMDL completion date is the

year that the TMDL is expected to be brought before the Central Valley Water Board for potential adoption. TMDLs with completion dates prior to 2011 already have resources allocated. Changes to the section 303(d) list in the future could result in substantial changes of the completion dates scheduled later than 2011. TMDLs for listings on the current (2006) 303(d) list are scheduled to be completed no later than 2019. TMDLs for proposed new listings are tentatively scheduled to be completed no later than 2021.

The proposed TMDL completion schedule was developed in compliance with federal law and regulation based on consideration of the criteria in Section 5 of the Listing Policy:

- “Water segment significance (such as importance and extent of beneficial uses, threatened and endangered species concerns, and size of water segment);
- Degree that water quality objectives are not met or beneficial uses are not attained or threatened (such as the severity of the pollution or number of pollutants/stressors of concern) [40 CFR 130.7(b)(4)];
- Degree of impairment;
- Potential threat to human health and the environment;
- Water quality benefits of activities ongoing in the watershed;
- Potential for beneficial use protection and recovery;
- Degree of public concern;
- Availability of funding; and
- Availability of data and information to address the water quality problem.”

DETERMINATION OF BENEFICIAL USE SUPPORT AND INTEGRATED REPORT WATERBODY CATEGORIES

To meet CWA Section 305(b) requirements of reporting on water quality conditions, each identified waterbody segment was assigned to one of five non-overlapping overall beneficial use-support categories. For consistency with other Regions in California and other States, six “core” beneficial uses were assessed. Most of the designated beneficial uses in the Basin Plans fit within these six “core” beneficial uses, which are:

1. Aquatic Life Support,
2. Drinking Water Supply,
3. Fish Consumption,
4. Secondary Contact (non-contact recreation),
5. Shell fishing, and
6. Swimming (contact recreation).

For each core beneficial use associated with each waterbody segment, a rating of fully supporting, not supporting, or insufficient information was assigned based on the readily available data and on proposed 303(d) listing decisions. The overall Integrated Report categories, below, are based on the use support ratings for all assessed core beneficial uses.

<u>Category</u>	<u>Description</u>
1	Evidence shows all core uses supported.

- 2 Evidence shows some core uses supported (at least 1).
- 3 Evidence is insufficient to make use support determinations.
- 4A. Evidence shows at least one use not supported (but a Total Maximum Daily Load (TMDL) is not needed). A TMDL has been developed and approved by USEPA and is reasonably expected to result in the attainment of the water quality standard within a reasonable, specified time frame.
- 4B. Evidence shows at least one use not supported (but a Total Maximum Daily Load (TMDL) is not needed). An existing regulatory program is reasonably expected to result in the attainment of the water quality standard within a reasonable, specified time frame.
- 4C. Evidence shows at least one use not supported (but a Total Maximum Daily Load (TMDL) is not needed). Impairment caused by non-pollutant sources. No provision for this exists in California.
- 5. Evidence shows at least one use not supported (and a TMDL is needed). (This is the official 303(d) list to be submitted to USEPA).

If a waterbody segment was currently or proposed to be listed on the 303(d) list, then the beneficial use(s) impacted by that standards exceedance were considered not fully attained, and therefore the waterbody was put into Category 5, unless no TMDLs are required for that waterbody, in which case it is put into category 4A, 4B, or 4C. If a waterbody segment had no existing or proposed 303(d) listings, it was put into category 1, 2, or 3. Staff did not conclude that any beneficial use was fully supported unless there was adequate data relevant to the core beneficial use being evaluated that demonstrated that there was no impairment to the use. Staff referred to USEPA guidance (USEPA 2003) and other available information regarding what monitoring information would be relevant for evaluating particular beneficial uses. There was insufficient information to evaluate protection of all beneficial uses for most water bodies and, as a result, relatively few water bodies were identified as fully supporting beneficial uses. This conservative approach was taken to prevent waterbodies with insufficient data from being classified as fully attaining standards, thus providing a more accurate baseline for future assessments.

Based on this approach, 386 waterbody segments were categorized in the preparation of this Integrated Report. Since they are currently or proposed to be 303(d) listed for impairments requiring TMDLS, 261 of the waterbody segments assessed are in Category 5. Six waterbodies were listed as impaired, but already had TMDLs for all listed impairments, so they are in Category 4A. Ninety-five waterbody segments were not found to be impaired, but lacked adequate data to determine full attainment of one or more beneficial uses; therefore they are in Category 3. Twenty-four waterbody segments are in Category 2 based on there being no documented impairment and a significant amount of bacteria data indicating attainment of the water contact recreation (swimming) beneficial use.

This was the first time that the Water Boards have prepared an Integrated 303(d)/305(b) Report under the current Listing Policy and USEPA Integrated Report Guidance. Combining the 303(d) list update with the 305(b) report added efficiency and ensured consistency, but provided challenges in terms of workload, project management, and level of detail. While individual assessments for potential 303(d) listings provide valuable information for the 305(b) report, creating the overall 305(b) report using 303(d) listing decisions as the primary input also has some limitations. Preparing assessment fact sheets at the level of detail required for

303(d) list changes under the Listing Policy limits the amount of data which can be assessed. The readily available data are also often biased towards areas with more potential discharges, since these areas are where the bulk of the monitoring activity takes place. For these reasons, the number of waterbody segments in each Integrated Report category is not necessarily a representative sampling of all the waterbodies within the Central Valley Region. Despite the limitations discussed above, this Integrated Report provides the most complete 305(b) report to date for the Central Valley Region. Future Integrated Reports could use statistical techniques such as random stratified sampling, or other means to make inferences about water quality in the many waterbodies where data are unavailable or insufficient to make direct, individual assessments of standards attainment. Also future Integrated Reports could provide more detail about the attainment of each core beneficial use, as opposed to one categorization based on all the core beneficial uses. The Water Boards' approach will continue to be refined in future Integrated Reports.

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For a complete list of references used in all the assessment fact sheets, see Appendix H.

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